

**53047
SPST SOLID-STATE RELAY**



FEATURES

- Available with Short Circuit Protection (SCP)
- Available with Output Status Feedback
- 1000 VAC RMS Isolation
- Power FET Output for Low On-state Resistance
- Full Military Temperature Operation:
-55°C to +105°C
- Military Environmental Screening Available
- Built and tested per MIL-R-28750 utilizing the test methods of MIL-STD-883
- Built in Accordance with 88062 - XXX

GENERAL DESCRIPTION

The MII 53047 is a military SPST solid-state relay. This light-weight device is resistant to damage from shock and vibration, and immune to contact-related problems inherent in mechanical equivalents.

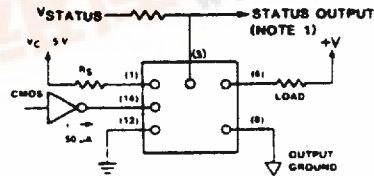
Effective isolation of 1000 VAC RMS between the input and output stages is achieved through the use of optical coupling. Power FET outputs eliminate bipolar offset, and minimize output voltage drop for high current capability

The control logic may be driven by either CMOS or TTL and will accommodate bias supplies between 3.8 and 32 VDC.

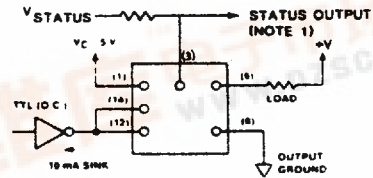
Integral short-circuit protection is an option. The device senses excessive current flow during switching or normal operating conditions and responds by opening the output. This feature prevents damage to the solid state relay and the system wiring. The second option is a status output. This feature provided in either switch status or trip status. Switch status line provides a logic 0 (low) when the output circuit is off and a logic 1 (high) when the output circuit is on. Trip status is available only with short circuit/over load protected relays. It provides a logic 0 (low) when the output is in a normal condition and returns a logic 1 (high) if the output trips off. Both options are available either together or separately as standard features.

**MILITARY, DC SOLID STATE RELAY
AVAILABLE WITH INTEGRAL SHORT CIRCUIT
PROTECTION AND OUTPUT STATUS FEEDBACK**

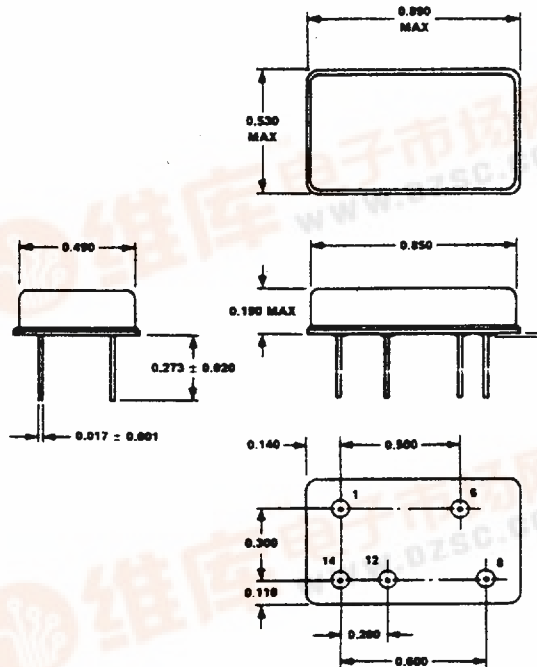
PACKAGE DIMENSIONS



CMOS CONFIGURATION



TTL CONFIGURATION



PART NUMBER

RELAY

53047 - 2	Solid State Relay with short circuit protection and switch status
53047 - 4	Solid State Relay with short circuit protection
53047 - 6	Solid State Relay with output status
53047 - 8	Solid State Relay only

Note: 53047 - 4 and 53047 - 8, pin 3 has no connection.
Both circuits are logically inverting

PIN	FUNCTION
1	INPUT + (V _{CC})
3	STATUS
6	+ OUT
8	- OUT
12	INPUT
14	CONTROL

Micropac Industries cannot assume any responsibility for any circuits shown or represent that they are free from patent infringement. Micropac reserves the right to make changes at any time in order to improve design and to supply the best product possible.

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SPST SOLID-STATE RELAY

ELECTRICAL CHARACTERISTICS* $T_A = +25^\circ\text{C}$

PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
Input Characteristics CMOS Configuration (Figure 1)					
Bias Supply Range, V_{DD}		3.8		32	VDC
Bias Current			12	15	mA
Input Current	5 VDC Input			250	μA
Control Voltage Range		3.8		18	VDC
Turn-Off Voltage (Assured)		2.8			VDC
Turn-On Voltage (Assured)				0.5	VDC
Input Characteristics TTL Configuration (Figure 2)					
Input Current			12	16	mA
Control Voltage Range		3.8		32	VDC
Turn-Off Voltage (Assured)				1.5	VDC
Turn-On Voltage (Assured)		3.8			VDC
Output Characteristics					
Output Current	$T_c = 25^\circ\text{C}$ max with straight line derating to 0 A @ 125°C			2.1	Amps DC
Continuous Blocking Voltage				60	VDC
On-State Resistance	$T_c = 25^\circ\text{C}$			0.15	Ohms
Turn-On Time	$T_c = 25^\circ\text{C}$, See Application Note 1			1.5	mSec
Turn-Off Time	$T_c = 25^\circ\text{C}$			1.0	mSec
Off-State Leakage (53047-2, 53047-6)	At Maximum Blocking Voltage			2	mA
Off-State Leakage (53047-4, 53047-8)	At Maximum Blocking Voltage			100	μA
Output Capacitance				850	pF
Input/Output Capacitance				10	pF
Dielectric Strength	60 Hz	1000			VAC RMS
Insulation Resistance	500 VDC			10^9	OHms
Junction Temperature				150	$^\circ\text{C}$
Thermal Resistance, θ_{JA}				90	$^\circ\text{C/W}$
θ_{JC}				25	$^\circ\text{C/W}$
Status Supply Voltage		1		18	VDC
Status Leakage Current	@ 16V			10	μA
Status Current	V Status ≤ 0.4 VDC			600	μA
Status Turn-On Time				3.5	mS
Status Turn-Off Time				8.0	mS
Overload Trip	Pulse = 5 mS			10	A
Current Surge without Tripping	Pulse = 100 mS			4.3	A
Electrical System Spike				± 600	VDC

APPLICATION NOTES

- Maximum input switching frequency not to exceed 20 Hz under normal conditions, or 1 Hz if output is shorted.
- Input transitions should be < 1 mS in duration and input source should be "bounceless contact" type.

TRUTH TABLE FOR SWITCH STATUS (53047-2, 53047-6)

Output State	Switch Status
Off	Low (V status ≤ 0.4 V dc)
On	High (open drain)

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